REMARKS

Claims 5-30 are pending in this application.

Claims 9-12, 14-19, 21, 23, 24 and 26 are withdrawn from the consideration.

Claims 5-8, 13, 20, 22, 25 and 27-30 are rejected.

Claims are amended.

No new matter has been added.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Claim Rejections- 35 USC § 112

Claims 5-8, 13, 20, 22, 25, and 27-28 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, with respect to claim 5, which recites a term "shoulder," the Examiner alleged that the instant specification does not define this term clearly and the term is not conventionally known in the art.

According to the Federal circuit in *Halliburton Energy Services, Inc. v. M-I* LLC, 514 F3d 1244, 85 U.S.P.Q. 2d 1654 (2008), claims are indefinite only where a person of ordinary skill in the art could not determine the bounds of the claims, i.e., the claims were insolubly ambiguous. Applicant respectfully submits that one skilled in the art would understand what is meant by the term "shoulder" in view of, for example, FIGS. 1-2B and the specification at page 8, lines 4-5 and lines 19-26 of the instant application, which states,

> "The electrode plate 1 is made by bonding the dielectric sheet plates 10, 20 together. The electrode plate 1 has an electric-connecting coupling hole which includes the small diameter electric-connecting coupling hole 12 of the first dielectric sheet plate 10 and the large diameter electric-connecting coupling hole 22 of the second dielectric sheet plate 20 which are arranged in line. Accordingly, in the electric-connecting coupling hole of the electrode plate 1, the shoulder 7 is formed. Referring Fig. 2A, the shoulder 7 is a circular step which is formed by a change of an inner diameter of the coupling hole. The internal electrode 16 is exposed on the shoulder 7."

Also, the term "shoulder" is quite well known in the art. Please refer to the US Pat. Nos. 7,559,542, 7,565,824, 7,568,843, 7,578,359 and 7,594,655, where the

term "shoulder" is commonly used. Thus, the rejection of claim 5 under 35 U.S.C. 112, second paragraph, is improper.

The Examiner also alleged that claim 7 does not define the terms "an electric connecting part" and "a non-electric connecting part" clearly and these terms are not conventionally known in the art.

Applicant respectfully submits that one skilled in the art would easily understand what is meant by the terms "an electric connecting part" and "a non-electric connecting part" in view of, for example, FIGS. 5 and 7 and the specification at page 8, lines 4-5 and lines 19-26 of the instant application, which states,

> "Referring to Fig. 5, a coupler element 41 includes an electric-connecting part 42, a non-electric-connecting part 44 and a joining part 46. The electric-connecting part 42 is positioned in the electric-connecting coupling hole of the electrode plate 1 and the gap over it. The electric-connecting part 42 has the shoulder 47 corresponding to the shoulder 7 in the electric-connecting coupling hole. In the electric-connecting part 42, a female threaded hole 48 is formed. The non-electric-connecting part 44 is positioned in the non-electric-connecting coupling hole and the gap thereover. The non-electric-connecting part 44 is inserted into the non-electric- connecting coupling hole with the second spacer 34 interposed therebetween."

Applicant believes that the meaning of the terms would be clear to one skilled in the art, especially considering FIG. 1, which shows non-electric-connecting coupling hole and electric-connecting coupling hole and the relevant description. *See* page 9, lines 13-16, which states,

> "The first dielectric sheet plate 10 which is coated with the metal paste has two small diameter holes. The metal paste on the first dielectric sheet plate 10 is coated surrounding one small diameter hole but not contacting with the other small diameter hole. The small diameter hole surrounded by the metal paste becomes the electric-connecting coupling hole 12. *The electric-connecting coupling hole 12 into which the electric-conductive coupler 40 is inserted is electric-connected with an electric source*. The small diameter hole which does *not contact with the metal paste becomes the non-electric-connecting coupling hole* 14.

Therefore, one skilled in the art upon reading the above descriptions and drawings mentioned above could easily determine the bounds of the claims. Thus, the rejection of claim 7 under 35 U.S.C. 112, second paragraph, is improper.

In addition, the Examiner argued that the terms "a small diameter" in claim 13 are not clear. In particular, the Examiner stated that "It is not clear if "a small diameter" of "the electric connecting coupling hole" in line 5 is the same as a small diameter of "the non electric connecting coupling hole" in line 6, or "a small diameter" of "the non electric coupling hole" in line 7.

Claim 13 is now amended to recite,

"wherein the electrode plate comprises a first dielectric sheet plate and a second dielectric sheet plate, the first dielectric sheet plate having the electrode on one surface onto which the second dielectric sheet plate is bonded;

the first dielectric sheet plate has a small diameter electric-connecting coupling hole which contacts with the electrode and a first small diameter non-electric connecting coupling hole; and

the second dielectric sheet plate has a large diameter electric-connecting coupling hole with a larger diameter than the small diameter electric-connecting coupling hole to define the shoulder and a second small diameter non-electric-connecting coupling hole with the same diameter as the first small diameter non-electric-connecting coupling hole; and

the first dielectric sheet plate and the second dielectric sheet plate are bonded together such that the small diameter electric-connecting coupling hole and the large diameter electric-connecting coupling hole are arranged in line to form the electric connecting coupling hole having the shoulder and the first small diameter non-electric-connecting coupling hole and the second small diameter non-electric-connecting coupling hole are arranged in line to form the non-electric-connecting coupling hole" to avoid a confusion pointed out by the Examiner.

Now, it is clear which small diameter has the same size as which small diameter. Thus, the rejection of claim 13 under 35 U.S.C. 112 is now overcome.

With respect to claim 20, which recites, "a change of an inner diameter of the coupling hole," the Examiner alleges that it seems impossible to lead to a change in the inner diameter since the limitation recites one coupling hole (i.e., the coupling hole) with one inner diameter (i.e., an inner diameter). Applicant does not agree with the interpretation of the terms given by the Examiner, especially in view of the applicant's response discussed with reference to claim 5 above. However, to facilitate

the allowance of this case, claim 20 is amended to recite only, "wherein the shoulder is a circular step." Thus, the rejection of claim 20 under 35 U.S.C. 112 is now overcome.

Claim Rejections- 35 USC § 102(b)

Claims 5, 20, 22, 25, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent App. Pub. No. 2002/0174938 to Li et al ("Li"). Applicant respectfully traverses this rejection.

Anticipation may be established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Systems, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984). Moreover, anticipation requires the presence of all elements of a claimed invention as arranged in the claim, such that a disclosure "that 'almost' meets that standard does not anticipate." Connell v. sears, Roebuck Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983).

The claimed invention recited in claim 5 is directed to the electric-connecting coupling hole (12 and 22 of FIG. 2A) having a shoulder 7, where the electrode 16a is exposed. Electric-conductive coupler 40 (e.g., FIG. 4) passes through dielectric sheet plates 10, 20 that form a electrode plate 1 and is in contact with the shoulder 7 to be electrically connected with the electrode 16. In particular, when the dielectric sheet plates 10 and 20 are stacked in line to form the electrode plate 1 as shown in FIG. 2A below, the shoulder 7 is formed (defined) as the diameter of the electric-connecting coupling hole 12 is smaller than the diameter of the electric-connecting coupling hole 22. The hole surrounding part 16a of the electrode 16 is therefore exposed on the shoulder 7.

FIG. 1

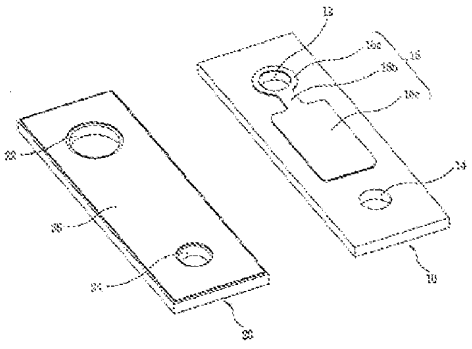
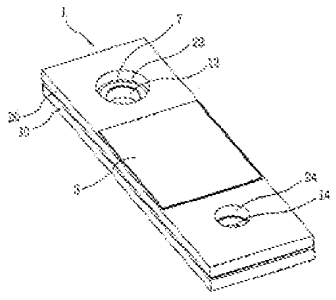
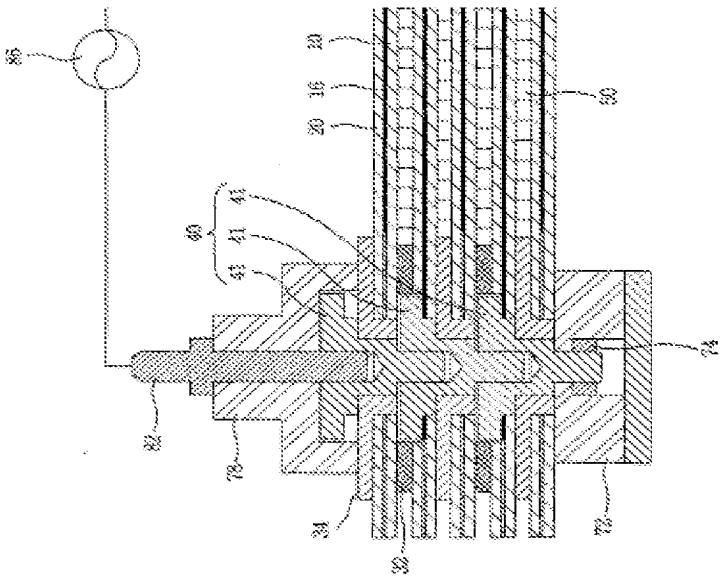


FIG. 2A



As a result, when the electric-conductive coupler 40 is coupled with the electrode plate 1 as shown below (FIG. 4), "electricity supplied to the electric-conductive coupler 40 [can be] transmitted to the hole surrounding part 16a, the connecting neck part 16b and the discharging part 16c in succession to generate a plasma discharge" as stated in page 8, lines 14-16 of the instant application.



Also see page 11, lines 20-25, which states,

> "The electric-conductive coupler 40 has a shoulder 47 corresponding to the shoulder 7 which is formed in the electric-connecting coupling hole. The shoulder 47 of the electric-conductive coupler 40 is caught into contact with the shoulder 7 in the electric-connecting coupling hole to be electric-connected with the electrode 16. Therefore, the electric-conductive coupler 40 is in plane contact with the electrode 16 and thus a reliable electric-connectivity can be obtained."

To reflect this unique concept of the claimed invention, claim 5 recites,

"A plasma reactor comprising:

more than two electrode plates, each electrode plate including a dielectric member and an electrode protected from a discharge space by the dielectric member and having an electric-connecting coupling hole on one side and a non-electric-connecting coupling hole on the other side, *the electric-connecting coupling hole having a shoulder on which the electrode is exposed*, the electrode plates being stacked such that a gap is interposed between the adjacent electrode plates and the

electric-connecting coupling hole and the non-electric-connecting coupling hole are alternately arranged,

a spacer installed between the adjacent electrode plates, and

an electric-conductive coupler which is inserted through an array of the electric-connecting coupling hole and the non-electric-connecting coupling hole to couple the electrode plates together, and is caught into contact with the shoulder to be electric-connected with the electrode,

wherein electricity is applied through the electric-conductive coupler to the electrode to generate a plasma discharge." (Emphasis added)

However, the Examiner alleged that Li (FIG. 5 shown below) discloses, *inter alia*, "two sets of vias 110 on ceramic plate 100, wherein one set is connected to the electrode 126 (i.e. electric connecting coupling hole one side) and the other set is separated from the electrode 126 and located on the opposing side [of] the ceramic plate (i.e. non-electric connecting coupling hole on the other side, element 110 in Figure 5, paragraph [0101]; and (4) *the vias 110 connected to the electrode 126 through a conductive lead 127 (i.e. a shoulder, Figure 5, paragraph [0101]*)." (Emphasis added)

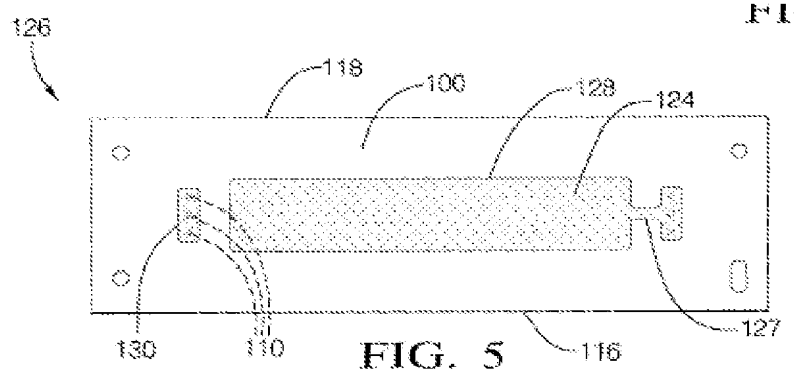


FIG. 5

On the contrary, nowhere Li does teach or disclose, for example, "*the electric-connecting coupling hole having a shoulder on which the electrode is exposed,*" "*an electric-conductive coupler which is inserted through an array of the electric-connecting coupling hole and the non-electric-connecting coupling hole to couple the electrode plates together, and is caught into contact with the shoulder to be electric-connected with the electrode*." The conductive lead 127 of Li, which the Examiner alleged as the shoulder of the claimed invention, cannot be the shoulder of the claimed invention recited in claim 5. This is because, in Li, the two sets of vias 110

are apart from the conductive lead 127. That is, the vias 110 do not have the conductive lead 127 as in the claimed invention. Thus, Li cannot teach or disclose, "the electric-connecting **coupling hole having a shoulder** on which the electrode is exposed."

Also, in Li, there is no "electric-conductive coupler … **inserted through … the electric-connecting coupling hole** and the non-electric-connecting coupling hole to couple the electrode plates together, and **is caught into contact with the shoulder to be electric-connected with the electrode**." No such electric-conductive coupler is inserted into the via 110 as shown below, not to mention the electric-conductive coupler caught in contact with the shoulder to be electric-connected with the electrode.

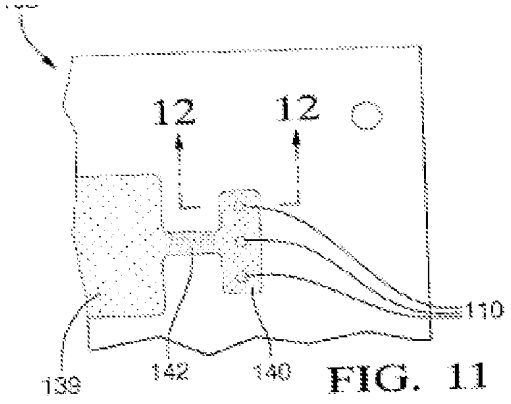


FIG. 11

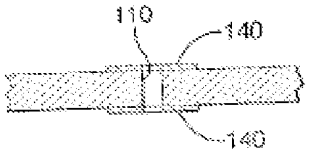


FIG. 12

It appears that Li is much more close to the prior art discussed in the background of the present application than to the claimed invention. See paragraphs [0015]-[0017] and [0019] and FIG. 14A-14Bof the present application.

For these reasons, the rejection does not present a *prima facie* case of anticipation as the cited references do not teach or disclose all of the limitations of claim 5. Thus, claim 5 is clearly in condition for allowance. Also, claims 20, 22, 25, 27 and 28, which depends from allowable claim 5, are also in condition for allowance at least for its dependency and their own merits. For example, for the reasons discussed above, Li does not teach or disclose at least, "the hole surrounding part has the same radial width as an exposed part of the shoulder."

Claim Rejections- 35 USC § 103

Claims 29 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Li as applied to claim 28 above.

Claims 6-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Li as applied to claim 5 above, and in further in view of U.S. Pat. No. 6,245,299 to Shiloh et al ("Shiloh").

Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Li as applied to claim 5 above, and in further in view of U.S. Pat. No. 6,039,816 to Morita et al ("Morita").

Applicant respectfully traverses the rejections.

As the Board of Patent Appeal and Interferences has recently confirmed, a proper obviousness determination requires that an Examiner make "a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art." *See In re Wada and Murphy*, Appeal 2007-3733, *citing In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis in original).

Therefore, the rejection does not present a *prima facie* case of obviousness as Li does not teach all of the features, e.g., "*the electric-connecting coupling hole having a shoulder on which the electrode is exposed," "an electric-conductive coupler which is inserted through an array of the electric-connecting coupling hole and the non-electric-connecting coupling hole to couple the electrode plates together, and is caught into contact with the shoulder to be electric-connected with the electrode*," of claim 5.

Thus, claims 6-8, 13, 29 and 30, which depend from allowable claim 5, are patentable over the cited references at least by virtue of their dependency and their own merits. For example, for the reasons discussed above, Li does not teach or disclose,

"the first dielectric sheet plate has a small diameter electric-connecting coupling hole which contacts with the electrode and a first small diameter non-electric connecting coupling hole; and

the second dielectric sheet plate has a large diameter electric-connecting coupling hole **with a larger diameter than the small diameter electric-connecting coupling hole to define the shoulder** and a second small diameter non-electric-connecting coupling hole with the same diameter as the first small diameter non-electric-connecting coupling hole; and

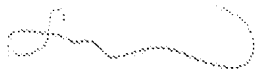
the first dielectric sheet plate and the second dielectric sheet plate are bonded together such that the small diameter electric-connecting coupling hole and the large

diameter electric-connecting coupling hole are arranged in line to form **the electric connecting coupling hole having the shoulder** and the first small diameter non-electric-connecting coupling hole and the second small diameter non-electric-connecting coupling hole are arranged in line to form the non-electric-connecting coupling hole," as recited in claim 13.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of all pending claims of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 896-2643 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,



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